IN THE CLAIMS

1. (Currently Amended) A seal for sealing an outer surface of a magnetically permeable shaft to an inner surface of a hub disposed about the shaft, the seal comprising:

(a) an annular magnet positioned between the shaft and the hub;

(b) a top pole piece and a bottom pole piece coupled to opposite poles of the magnet, both the top and the bottom pole pieces comprising a magnetically permeable material ~~which is magnetically permeable,~~ and having annular shapes with interior radii that are larger than ~~the~~ a radius of the outer surface of the shaft, the top pole piece ~~comprising~~ having a cross-sectional area that is substantially L-shaped, ~~having~~ and includes a long horizontal portion orientated substantially parallel to a surface of ~~a pole~~ one of the opposite poles of the magnet, and a shorter vertical portion orientated in a facing, non-contact relationship to the outer surface of the shaft, and wherein a first gap separating the top pole piece from the outer surface of the shaft is smaller than a second gap separating the bottom pole piece from the outer surface of the shaft; and

(c) a ferrofluid magnetically held between the vertical portion of the top pole and the outer surface of the shaft to form a seal therebetween.

2. (Currently Amended) A seal according to claim 1 wherein the ~~top pole piece is separated from the outer surface of the shaft by a~~ first gap ~~which~~ is smaller than a distance separating the top pole piece from the bottom pole piece.

3. (Currently Amended) A seal according to claim 2 wherein the shaft further comprises ~~and~~ an inner race of a bearing separating the shaft from the hub, and wherein the gap is smaller than a distance separating the top pole piece from the inner race of the bearing.

4. (Currently Amended) A seal according to claim 1 wherein the top pole piece comprises a curved corner where the vertical portion joins the horizontal portion, the

curved corner being adapted to ~~spread~~ generate a magnetic flux gradient over a larger area, thereby enabling the ferrofluid to be held over a larger area.

5. (Currently Amended) A seal according to claim 1 wherein a ~~Nickel~~ nickel cladding is applied to the top pole piece to provide a substantially smooth surface ~~in~~ for contacting ~~contact~~ with the ferrofluid.

6. (Withdrawn) A seal according to claim 1 wherein the shaft comprises a contoured portion, and wherein the seal is positioned between the shaft and the hub so that the vertical portion of the top pole piece ~~is in a facing relationship to~~ faces the contoured portion.

7. (Currently Amended) A spindle motor comprising the seal of claim 1, the spindle motor further comprising:

(a) a base to which the shaft is coupled;

(b) a bearing capable of rotatably supporting the hub about the shaft, the bearing having inner and outer races affixed, respectively, to the shaft and to the hub ~~respectively~~;

(c) magnets attached to the hub; and

(d) a stator winding ~~on the baseplate~~ coupled to the base and adapted for ~~capable of~~ interacting with the magnets on the hub to cause ~~it to turn~~ the hub to rotate relative to the shaft.

8. (Withdrawn) A seal for sealing an outer surface of a shaft to an inner surface of a magnetically permeable hub disposed about the shaft, the seal comprising:

(a) an annular magnet ~~with~~ having a pair of annular pole pieces coupled to opposite poles thereof, the annular magnet positioned between the shaft and the hub, the pole pieces comprising a magnetically permeable material and having exterior radii that are smaller than a radius of the inner surface of the hub;

(b) a catcher affixed to the inner surface of the hub, the catcher made of a magnetically permeable material and comprising an annular ring having a curved

surface on the interior radius thereof, the curved surface ~~in a~~ facing ~~relationship to~~ the exterior radii of the pole pieces; and

(c) ferrofluid magnetically held in a gap separating the pole pieces from the catcher ~~affixed to the inner surface of the hub~~,

whereby when the hub is rotated relative to the shaft, splashing or outward migration of the ferrofluid it is substantially reduced.

9. (Withdrawn) A seal according to claim 8 wherein the curved surface ~~comprises~~ has a U-shaped cross section ~~cross-sectional area having a U-shape~~, and wherein open ends of the U-shape extend radially inward past the exterior radii of the pole pieces.

10. (Withdrawn) A seal according to claim 8 wherein the pole pieces, ferrofluid, catcher and hub are comprised of ~~comprise~~ electrically conductive materials, and wherein the pole pieces are electrically coupled to the shaft, the ferrofluid is electrically coupled to the pole pieces and to the catcher, and the catcher is electrically coupled to the hub, and wherein the outer radii of the pole pieces and the inner radius of the hub are ~~selected~~ configured so that a surface area of ferrofluid electrically coupling the pole pieces to the catcher ~~provide~~ provides a resistance of less than about 1×10^9 ohms.

11. (Withdrawn) A seal for sealing an outer surface of a stationary shaft to an inner surface of a hub that is supported for rotation about the shaft by at least one bearing having an inner race and an outer race affixed, respectively, to the shaft and to the hub ~~respectively~~, the seal comprising:

(a) an annular magnet ~~with~~ having a pair of annular pole pieces coupled to opposite poles thereof, the annular magnet positioned between the shaft and the hub;

(b) a magnetic shield arm extending from said outer race ~~over but not connected to the inner race~~ to a position between the shaft and the magnet and pole pieces, wherein the magnetic shield arm extends over, but is not connected to, the inner race; and

(c) a ferrofluid magnetically held between the pole pieces and the magnetic shield arm to form a seal between the shaft and the hub.

12. (Withdrawn) A seal according to claim 11 wherein the magnet has an interior radius that is larger than a radius of the outer surface of the shaft, and the pole pieces ~~having~~ have interior radii that are larger than the radius of the outer surface of the shaft but smaller than the interior radius of the magnet, and wherein the magnetic shield arm extends between the inner radii of the pole pieces and the shaft.

13. (Withdrawn) A seal according to claim 11 wherein the magnetic shield arm ~~comprises~~ has a cross-sectional area that is substantially L-shaped~~, having~~ and has a radial segment fastened to the outer race, the radial segment being ~~at~~ of sufficient length to extend over ~~and~~ an interior to the inner race, and ~~a~~ an axial segment extending substantially parallel to the shaft and between the shaft and the poles of the magnetic seal.

14. (Withdrawn) A seal according to claim 13 further including a support arm extending axially from the stationary shaft towards the hub, a ~~distal~~ region of the support arm distal from the shaft supporting a radially outer end of the annular magnet and annular pole pieces, the annular magnet and annular pole pieces extending radially inward towards the shaft from the support arm.

15. (Withdrawn) A seal according to claim 11 wherein a Nyebar® coating is applied to the magnetic shield arm to reduce radial migration of the ferrofluid away from the seal.

16. (Withdrawn) A seal according to claim 11 wherein a ~~Nickel~~ nickel cladding is applied to the magnetic shield arm to provide a substantially smooth surface ~~in contact with~~ for contacting the ferrofluid,

17. (Withdrawn) A seal according to claim 11 wherein the top pole piece comprises a ~~cross-sectional area that is~~ substantially L-shaped cross section[[,]] having a long horizontal portion orientated substantially parallel to a surface of a pole of the magnet, and a shorter vertical portion ~~in a~~ facing ~~relationship with~~ and orientated substantially parallel to a shield portion of the magnetic shield arm.

18. (Withdrawn) A seal according to claim 17 wherein the vertical portion of the top pole piece comprises a contoured surface facing the shield portion of the magnetic shield arm to introduce a magnetic flux gradient between the top pole piece and the shield portion that axially concentrates the ferrofluid between a center of the contoured surface of the vertical portion and the shield portion of the magnetic shield arm.

19. (Withdrawn) A seal according to claim 11 wherein the support arm comprises a non-magnetic material.

20. (Withdrawn) A seal according to claim 11 wherein the magnetic shield arm comprises ~~a magnetic~~ stainless steel ~~material~~.

21. (New) A seal for sealing an outer surface of a magnetically permeable shaft to an inner surface of a hub disposed about the shaft, the seal comprising:

(a) an annular magnet positioned between the shaft and the hub;

(b) a top pole piece and a bottom pole piece coupled to opposite poles of the magnet, the top and bottom pole pieces having non-identical cross sections, both the top and the bottom pole pieces comprising a magnetically permeable material and having annular shapes with interior radii that are larger than a radius of the outer surface of the shaft, the top pole piece having a cross-sectional area that is substantially L-shaped, and includes a long horizontal portion orientated substantially parallel to a surface of one of the opposite poles of the magnet, and a shorter vertical portion orientated in a facing, non-contact relationship to the outer surface of the shaft; and

(c) a ferrofluid magnetically held between the vertical portion of the top pole and the outer surface of the shaft to form a seal therebetween.